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ANNUAL REPORT

WABASH VALLEY INTERSTATE COMMISSION

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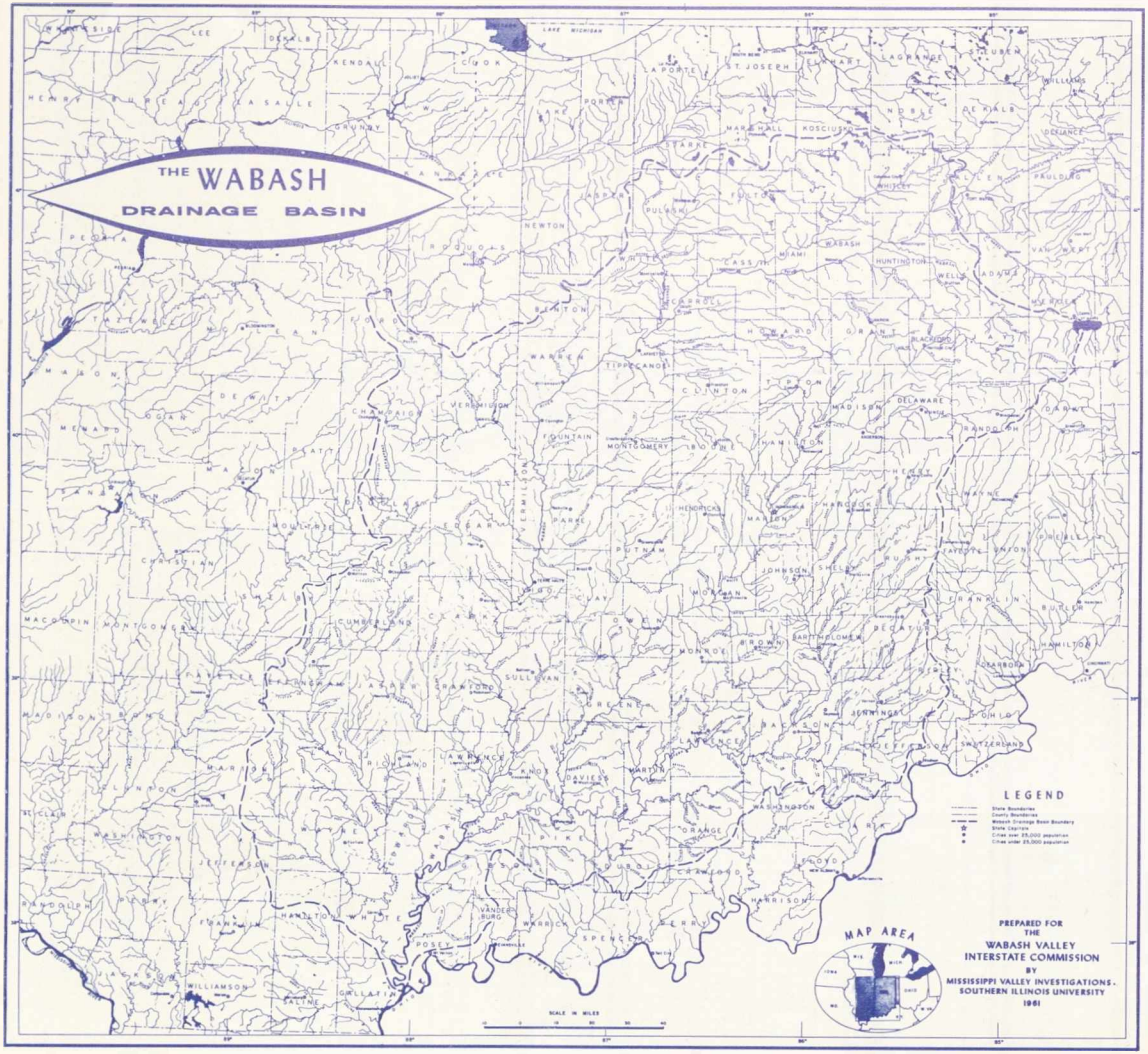
THE WABASH
DRAINAGE BASIN
LEGEND
MAP AREA
PREPARED FOR
THE
WABASH VALLEY
INTERSTATE COMMISSION
BY
MISSISSIPPI VALLEY INVESTIGATIONS -
SOUTHERN ILLINOIS UNIVERSITY
1961

FOREWORD

The Wabash Valley Interstate Commission was created with the signing of the Wabash Valley Compact between the two states, Indiana and Illinois. The Commission's staff was appointed and the Commission's office was opened on August 1, 1960; this second annual report, therefore, represents the first full year of activity by the Commission.

The Compact between Indiana and Illinois was the first attempt to obtain interstate cooperation for the purpose of developing all of the resources of a river basin. It was deemed necessary to establish a pilot study to devise a pattern for investigation of resource management and development problems and the procedures for presenting regional planning to the people of an area. At one of its early meetings, the Commission selected the Embarrass River Basin in Illinois as this pilot area because major developmental projects were neither under construction nor planned for this watershed.

This second annual report is presented summarizing the preliminary study of the Embarrass Basin and indicating the need for additional investigations to enable the preparation of regional plans for this basin and for the Wabash Valley.

Delyte W. Morris

Delyte W. Morris, Chairman
Wabash Valley Interstate Commission

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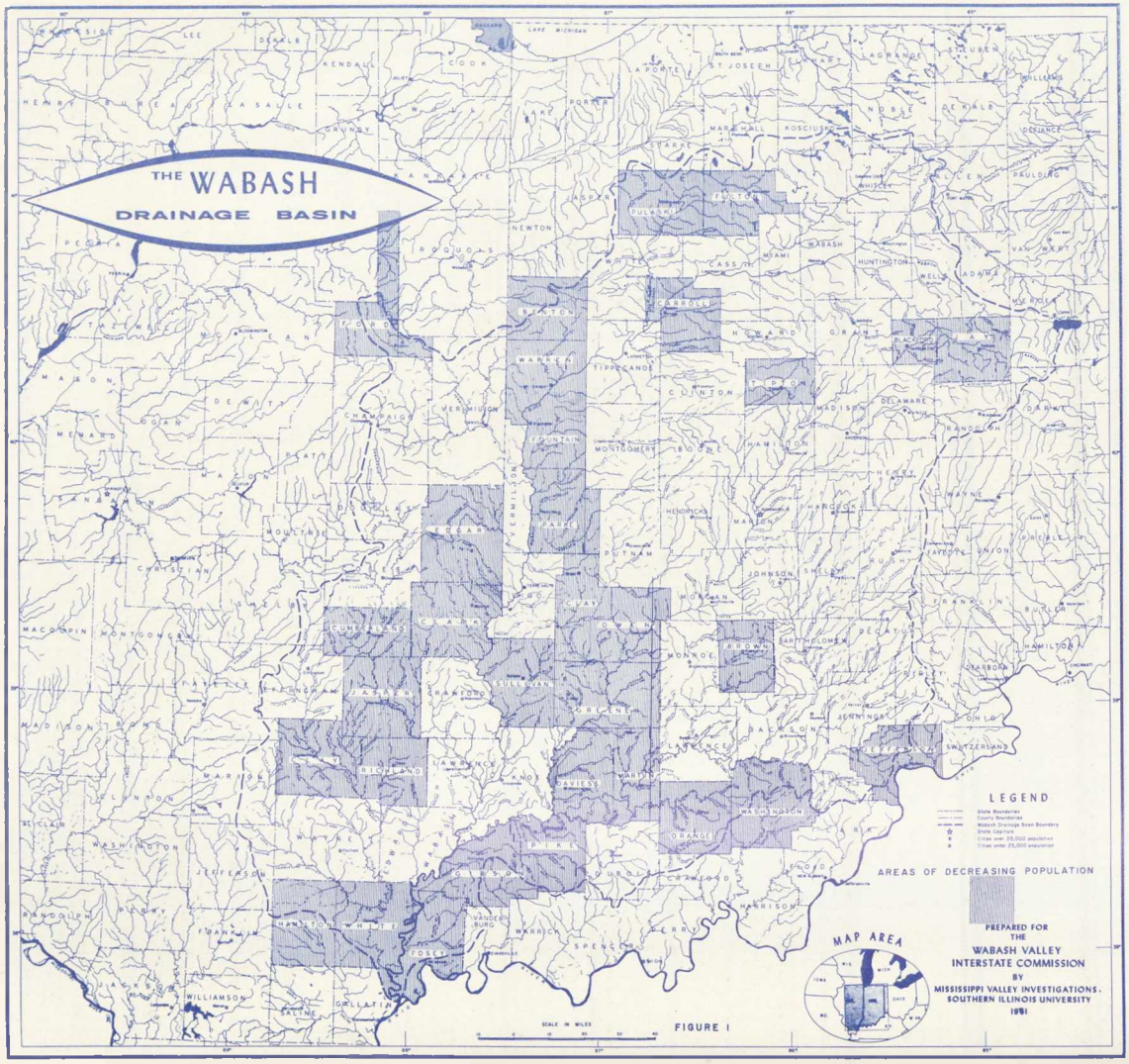
ANNUAL REPORT
of the
WABASH VALLEY INTERSTATE COMMISSION
for the
Calendar Year, 1961

The purpose for which the Wabash Valley Interstate Commission was created and the objective of regional planning for the Wabash Valley as envisioned by those who conceived the agreement between Indiana and Illinois is stated in Article I of the Wabash Valley Compact.

> "The party states find that the Wabash Valley has suffered from a lack of comprehensive planning for the optimal use of its human and natural resources and that underutilization and inadequate benefits from its potential wealth are likely to continue until there is proper organization to encourage and facilitate coordinated development of the Wabash Valley as a region and to relate its agricultural, industrial, commercial, recreational, transportation, development and other problems to the opportunities in the Valley. To this end it is the purpose of the party states to recognize and provide for such development and coordination and to establish an agency of the party states with powers sufficient and appropriate to further regional planning for the Valley."

Large areas of the Valley have long been plagued with the problem of affording adequate economic opportunity to their people. That this problem has not been effectively solved is evidenced by the population changes which have occurred within the past decades, (Figure 1). Some of these areas have experienced consistent and continuing decreases in population throughout the 20th Century; other areas have shown population decreases for at least the past two decades. Relatively small areas of the Valley have experienced increases in population which approach the average rate of increase for the nation as a whole; many counties have an essentially stable population pressure having shown little change decade by decade throughout the past fifty years.


THE WABASH
DRAINAGE BASIN
LEGEND
AREAS OF DECREASING POPULATION
MAP AREA
PREPARED FOR
THE
WABASH VALLEY
INTERSTATE COMMISSION
BY
MISSISSIPPI VALLEY INVESTIGATIONS,
SOUTHERN ILLINOIS UNIVERSITY
1961
SCALE IN MILES
FIGURE 1

When considering the purpose of regional planning for the Valley, the objective to be attained must first be determined. Reviewing the reasons for the outward migration of people from various areas within the Valley, one of two premises can be assumed; it is upon this assumption that the activities of the Commission can be based.

1. Certain portions of the Valley have been and presently are over populated in terms of the resources available to support the economy of these areas.

2. The migration of people from certain areas of the Valley has occurred because the resources of those areas remain undeveloped.

If the first premise is accepted, we have only to wait until the outward migration has reached sufficient proportions to establish an equilibrium between the number of employable individuals and the economic opportunities afforded by the available resources.

A cursory review of resource development within the Basin indicates the second premise to be most acceptable. On many farms throughout the Valley present crop yields represent only a fraction of the productive capacity as shown by the productivity indices of the soils; less than 25% of the annual growth of timber is cut from our 4,000,000 acres of forest land and within this area are hundreds of thousands of acres on which are produced only a small portion of the annual timber growth possible; with the growing national demand for water for industrial and municipal use, efforts within the Wabash Basin are directed toward flood control with minimal attention to a coordinated program of total water development; thousands of acres of scenic wasteland remain unused even though the demand for recreational land far exceeds that presently available for this use.

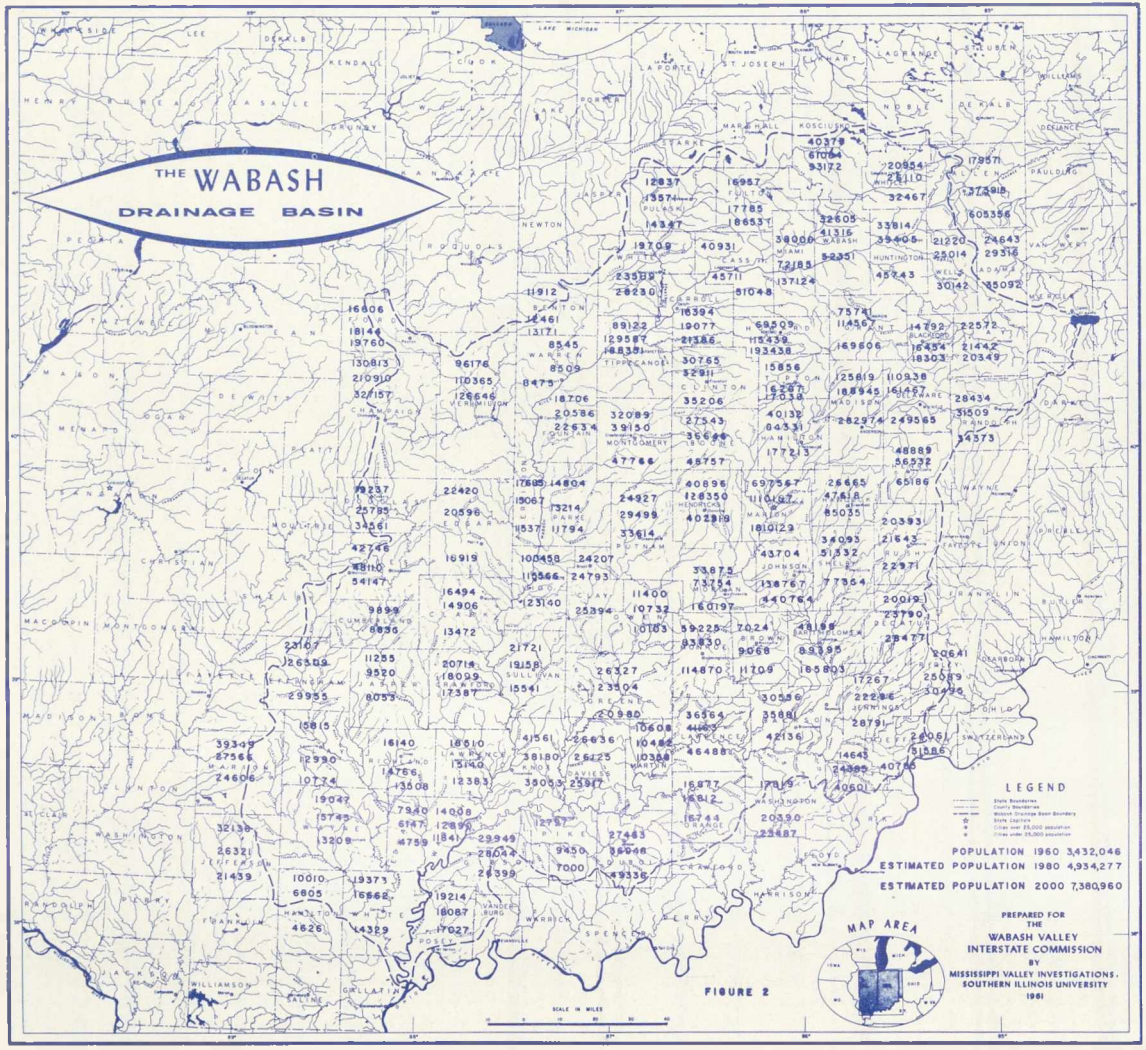

THE WABASH
DRAINAGE BASIN
LEGEND
POPULATION 1960 3,432,046
ESTIMATED POPULATION 1980 4,934,277
ESTIMATED POPULATION 2000 7,380,960
PREPARED FOR
THE
WABASH VALLEY
INTERSTATE COMMISSION
BY
MISSISSIPPI VALLEY INVESTIGATIONS,
SOUTHERN ILLINOIS UNIVERSITY
1961
MAP AREA
SCALE IN MILES

FIGURE 2

Consideration must also be given to the necessity for providing job opportunities for additional thousands of people within the next decades, (Figure 2). Although the population increase to be experienced in this region, undoubtedly, will not approach the rate of growth for the nation as a whole, present trends are indicative of the need for thousands of additional jobs each year. Opportunities for employment for an ever-increasing labor force can be provided only through continuing development of the resources of a region.

Resource management and development planning for the Wabash Valley, therefore, must recognize the degree to which resources are now utilized and identify and provide for the development of presently unused resource potential.

NATURAL RESOURCE INVENTORY AND APPRAISAL

Basic to the establishment of any plan, whether it be for resource development or for any other purpose, is an analysis of present conditions and an evaluation which establishes the differential between conditions as they exist and the potential to be achieved. The Commission, with the cooperation of numerous state and federal agencies, has initiated a county-by-county resource appraisal which, when completed, will provide a detailed inventory of our resources and a measurement of the degree to which they are now being utilized. Concomittant with the establishment of the degree of utilization will be the identification of the opportunities for development.

The Land Resource

The land resource study considers the soil as the basic resource to agriculture and the land as it may be a suitable site for the use man

makes of land as a locational factor in his environment.

The soil regions and the characteristics of the soil have been combined with factors of slope, degree of erosion and the problems of erosion and drainage to provide a basis for land classification categorizing the land as (1) land suited to cultivation, (2) land available for limited cultivation, (3) land adapted for cultivation with restrictive conservation practices and (4) nonagricultural land. Those areas classified as nonagricultural are to be further identified according to suitability for use as recreational land, industrial sites, suburban residential areas and other uses for which man desires to devote land. As the planning program progresses, there will, undoubtedly, be a need for providing information on suitability ratings for nonagricultural uses of agriculturally suitable land. At present, and probably for many years hence, the demand for land for nonagricultural uses will exceed the need for agricultural land. The study of the land resource in the Embarrass River Basin indicates the need for land for nonagricultural usage exceeds the availability of nonagricultural land. In this Basin future expansion of the use of land for urban, recreational and similar uses will, undoubtedly, require the use of some land suitable for cultivation.

Land use suitability ratings used in classifying land are presented in a Technical, Management and Information Note prepared by L. J. Bartelli in July, 1961, for Soil Conservation Service personnel in Illinois. Mr. Bartelli, then State Soil Scientist for Illinois, used land capability classes, productivity and crop adaptability in classifying land for production of cultivated crops and the factors of topography, permeability, wetness, stability, texture and ability to provide vegetative growth in

determining suitability ratings for nonagricultural land use.

Evaluation of the degree of efficiency of our use of the land resource is accomplished through a comparison between present production and the productivity indices of the soils, determination of present land use as opposed to the land capability and the identification of tracts which under present usage are marginal and submarginal economic areas. This appraisal forms the basis upon which recommendations for more efficient use of the land resource may be made.

The Water Resource

Water is possibly the greatest single resource of the Valley and is at the same time a resource which is little used. Billions of gallons are available for utilization; yet, very limited use is made of this resource. Two factors influence this lack of development--lack of control of surface water and incomplete knowledge concerning the occurrence of ground water.

Considerable attention has been given the development of an effective flood control and flood prevention plan; this plan, when completed, represents only one phase of the water program and must be correlated and coordinated with a comprehensive water management program to enable effective use of this resource.

The Commission has requested the Chief of Engineers, U. S. Army, Corps of Engineers, to include in the budget for fiscal 1963 sufficient funds to enable completion of the flood control plan for the Wabash Basin. Recommendations for further water development can then be made based upon sound engineering principles which will minimize the hazards imposed by uncontrolled water and provide for maximum use of controlled

water.

Increased use of water in the Valley depends primarily on the possibility of storing this water to permit regulation of the volume carried by our streams. To permit planning for full utilization of this resource, it is necessary to determine where water can be impounded, what reservoir capacity can be obtained and the annual water yield of the proposed reservoirs, the quality of the water which can be provided and an estimate of the cost of constructing impounding structures.

The acquisition of this knowledge will enable determination of the real value of our water resource. At present it is impossible to evaluate this resource since we have not identified the locations possible to develop nor the supply of water available at these locations.

A factor severely affecting the utilization of water regardless of supply is the quality of the resource. Pollution has long received the attention of local, state and federal governmental agencies and the control of pollution from municipal and industrial sources has been accomplished over most of the Wabash Basin. Although progress has been made and is continuing in this phase of the pollution problem, too little attention has been given water quality reduction through temperature increase and relatively little progress has been made in reducing the adverse effects of soil particles as a water pollutant. Pollution of both surface water and ground water by mine wastes and waste from our oil fields is increasing through those areas of the Valley where mineral recovery operations have been developed.

The Timber Resource

Four million acres of forest lands lie within the boundary of the

Wabash Valley; some of it is covered with good timber, much of it is abused, mismanaged and essentially worthless. Even though this resource is producing only a small percentage of the potential possible, our utilization of this resource represents only about one-fourth of the natural growth. Our forest resource exhibits both under-production as well as under-utilization of that which is now produced.

Various studies by technical foresters employed by the two states and by the federal government in cooperation with those employed by forest products producing industries have provided rather complete information on the quantity and quality of the timber resource with rather limited information on the areal distribution of this resource. Additional information is required on those factors influencing the lack of complete utilization of the resource available in our forests today if we are to develop and market these products.

The Recreation Resource

The wildlife resource, particularly game and fish populations, represents a resource which has received almost no attention as a potentially valuable factor in the economy of the Wabash Valley. Although a few attempts have been made to develop commercial recreation areas based upon hunting and fishing, the efforts have been made by individuals at widely scattered locations and few attempts have been made to encourage this economic activity as an alternate use of marginal or submarginal land or as a concerted effort to improve the economy of an area of the Valley.

Areal analysis of this resource indicates a wildlife population which exists because of the ability of certain species to adapt to an

environment suited to other primary uses by man; there are relatively few isolated instances of the development of habitat areas compatible with the needs of wildlife. The fact that wildlife exists with little or no encouragement by man would suggest that vast improvement in this resource could be accomplished through a conscious effort to encourage production. A cursory review of the land classification map shows considerable land which could be devoted to wildlife habitat development probably much more profitably than is the present usage if developed under a commercialized recreational program.

Increased demand for recreational usage of land has occurred as man is afforded more leisure time. The relative location of the Wabash Basin presents many advantages for development of many types of recreational facilities. Surrounded as it is by the metropolitan areas of the Middle West, no portion of the Valley is more than a few hours away from millions of people desiring to make use of recreational areas. Complementing this locational advantage are the many site advantages of the Basin. Careful inventory of historic sites and areas of scenic beauty will provide opportunities in planning for and developing this resource to the economic advantage of the region.

THE INVENTORY

Progress has been made during the past year in conducting this inventory and appraisal. Numerous state and federal agencies are cooperating with the Commission in an effort to obtain this information at the earliest possible date. There are, however, certain deterrents to rapid accomplishment of a complete inventory; each cooperating agency already has a full schedule of work and limited personnel with which to

accomplish committments previously made or assigned to it. The request of the Wabash Valley Interstate Commission for assistance in making this inventory and resource use appraisal represents a schedule of work not anticipated in the budgets of these agencies; therefore, none of the agencies has sufficient funds to acquire the services of additional personnel, a condition which permits little more than a token effort toward the Commission's resource appraisal program. The Commission, likewise, has not been provided a budget sufficient to employ the necessary personnel nor to contract for the work required to complete such an analysis in a reasonable period of time. Essential as this work is in the preparation of a resource management plan for the Wabash Valley, it cannot be accomplished without significant increases in funds available to the various state agencies who have responsibilities in these areas of resource development.

THE EMBARRASS RIVER BASIN
A PILOT STUDY IN BASIN RESOURCES MANAGEMENT

As the initial step in the development of a plan for the Embarrass River Basin, the Commission prepared a report on the resources of the Basin. This report is a compilation of information about the resources of the region that is presently available. Accumulation of these data not only provided information on the Basin in a single volume but it enabled the identification of areas in which adequate knowledge is not now available, thus, indicating those facets of resource analysis which require further study and research.

Since the Embarrass Basin study has been published by the Commission, only a brief summary is included in this report.

The Embarrass River Basin is essentially an agricultural region extending from the cities of Champaign-Urbana to southeastern Lawrence County. The watershed includes approximately 2,500 square miles of land, 85% of which is suitable for some agricultural use. The river originates in the wet prairies of southern Champaign County, meanders across Douglas and northern Coles Counties in which area it is joined by numerous sluggish prairie streams. Soon after entering Coles County, the Embarrass drops into a gorgelike valley which it has cut through the terminal moraine of the Wisconsin Ice Sheet. In this middle portion the river is joined by five large tributary streams, each of which flows in an equally deep entrenched valley. Beyond the moraine the valley is broad and flat-bottomed and the river meanders through a productive flood plain.

If it is possible to identify one resource as more valuable than other resources, water and soil are probably the resources most basic to the economy of this region and are quite generally so recognized by the people of the region. Yet, the water is little used except by growing vegetation and the land is mismanaged to such a degree that an estimated 5% of one township in the moraine area has been abandoned from use as cropland in the past 25 years. Agricultural production does not approach the potential indicated by soil productivity indices and although numerous reservoir sites are available, only two small impoundments have been constructed on the Embarrass and its major tributaries utilizing a very small percentage of the millions of gallons of water available.

Water problems include inadequate drainage on the uplands in the upper and middle portions of the basin, excessive erosion and flooding in the middle and lower portions of the watershed.

Although Soil and Water Conservation Districts are organized in every county in the basin and have existed for 15 to 20 years, farm conservation practices have been applied on only a small percent of the total farm land. Few attempts have been made to develop conservation practices on other than an individual farm basis. Solutions to farm soil and water problems are still being sought with little or no consideration for the downstream effects and still less thought about the upstream causes. Only two watershed projects are proposed for development to control flooding and stabilize the land surface. One of these, the Upper Embarrass Watershed, has just been organized and the application for federal assistance under Public Law 566 was recently approved by Governor Kerner and submitted to the U. S. Department of Agriculture where it received favorable consideration. The other, Scattering Fork Watershed, also in the upper reaches of the basin, has reached the final planning stage but it encompasses only 83,000 acres. Thus, only a small portion of this river basin is organized to obtain assistance in controlling water and stabilizing the land surface. Seven watersheds have been defined within the area drained by the Embarrass and each of these watersheds should be developed at the earliest possible date.

The need for land stabilization programs in this basin can perhaps be best illustrated by showing the interrelationship between erosion of the soil and the drainage and flooding problems within the basin. Inadequate drainage on the uplands causes annual crop losses to the farmers in Champaign, Douglas, Coles, Edgar, Clark and Cumberland Counties and produces flooding in the towns and villages of these counties during periods of heavy rain. The inadequacy of these drainage

systems is directly associated with the deposition of silt in the streams into which drainage ditches and tile lines discharge water, including the Embarrass River.

Farther downstream in Cumberland, Jasper, Crawford, Richland and Lawrence Counties the residents are plagued with flood problems. This excess water which spills over productive land and into the towns and villages results from the lack of upstream control and the fact that stream channels are clogged by silt, sand and gravel and the vegetation which grows on the sand and mud bars in the River and its tributaries.

Further evidence of the need for land stabilization is illustrated in the history of Lake Charleston. This reservoir, built by the City of Charleston, was first filled with water in August, 1947. The Illinois Water Survey conducted a sedimentation study of the reservoir in August, 1961; in this 14 year period 40% of the original volume of this lake had been lost through deposition of material eroded from the land lying upstream.

The terrain of the middle Embarrass Basin will permit the construction of numerous reservoirs, several sufficiently large to be of value for municipal, industrial and recreational use; but, without land stabilization above these reservoir sites, impoundments of water would have a very limited useful life expectancy.

Although millions of gallons of water flow through the Embarrass River and its tributaries, very limited use is made of this water. Charleston is the only city using water from the mainstream and pumps only a million gallons per day. Oakland with a population of 1,000 uses an impoundment on the Little Embarrass River for water supply.

Probably the least progress in resource development in the Embarrass

Watershed has been in the utilization of the surface water resource. Inadequate drainage of the uplands; lack of flood control in the bottomlands; water shortages in towns, cities and on the farm; these phases characterize the status of development of this valuable resource within the drainage basin of the Embarrass River. To achieve maximum value from this resource a comprehensive water management plan encompassing control and utilization of the water of the basin from the time it falls upon the land until it leaves the basin area must become a reality.

To provide technical data on which to base specific recommendations within such a plan, the Illinois Division of Waterways is engaged in a complete analysis of the surface water problems in the Embarrass Basin. From this investigation will come recommendations of work to be accomplished which will enable control of the water in the mainstream and the major tributary streams. The Illinois Water Survey is preparing a report on the potential reservoir sites within the watershed of the Embarrass which will contain data on site location, yield and quality of water and estimates of cost of constructing impounding structures.

Development and utilization of the forest resource presents a three-faceted problem - reforestation on unused land which is not now protected by vegetation, increasing the productivity of present timber stands and the development of more efficient marketing procedures.

Decisions must be made locally as to the most desirable use to be made of these acres presently neglected and which are not adequately protected by vegetation; these lands may be developed as recreational areas, forest lands or for some other suitable purpose.

The problem of increasing the productivity of forestlands in this

basin has been of primary concern to state and federal foresters for some time. Perhaps some of the lack of interest of landowners in timber production has resulted from the difficulty often experienced in marketing harvestable trees. This results from a combination of factors; the small acreage of woodland under single ownership, the usually small number of harvestable trees in a single sales transaction, the lack of concentration of salable trees within the wooded area and the relatively low quality of many of the mature trees. These are problems which must be resolved before maximum use can be made of the forest resource.

The wildlife resource at present is little used as an economic resource in this area even though hunting pressures are great. Those who desire to hunt game birds and mammals find that too little is available to them for hunting; the landowner often finds the wildlife population on his farm to be a nuisance because it attracts an over supply of hunters. Game biologists frequently find it difficult to obtain the cooperation of farmers in establishing wildlife habitat because of the problems associated with the harvest of these birds and animals. Most landowners in this basin are not as interested in obtaining income from the wildlife resource as they are in protecting their property from the ravages of a heavy hunting population. This would indicate the need for a program of controlled hunting and associated with controls on the hunting population should be an attempt to provide some income for the landowners and operators on whose land this game has been produced.

Quail, pheasants, rabbits, squirrel and some deer are found in the Embarrass Basin. The fact that these game species exist in sufficient

numbers to provide a harvestable surplus with little or no specific efforts to provide suitable habitat is quite significant. Provision of desirable habitat areas should accomplish rather large increases in these game populations and combined with the establishment of lands available for hunting under a controlled commercial program could provide a valuable resource for certain areas of this Basin.

Mineral production within the Embarrass Valley has been of great benefit to those communities within the immediate resource area but have not been particularly significant to the Basin in its entirety. The great economic contribution has been from petroleum production with minor and spasmodic operations producing coal, limestone, sand and gravel. Petroleum has been produced in this region since the early part of the 20th Century; deeper drilling and secondary recovery methods have continued production at a high level. Although it is difficult to estimate petroleum reserves, it is highly probable that large reserves of oil and gas are present in deeper structures and that considerable pools at present levels of operation are still undiscovered.

Although coal reserves underlie most of the Embarrass Basin, only two mines are in operation at the present time and one of these sells only to local trade. Mineable reserves occur in every county in the basin and, in total, amount to 8-10 billions of tons. All of this coal is high volatile bituminous coal, steam coal, valuable as a basic raw material in the production of thermo-electric power. Future development of these vast coal reserves depends upon advances in the technology of recovery methods and upon the price structure in the power resource field.

This brief resume indicates the need for additional knowledge before conclusions can be reached and specific recommendations made for implementing projects to enable more efficient use of the resources of this Basin.

Included in the studies to be completed on specific phases of resource management within the Embarrass Basin and the agencies preparing these reports are the following:

1. Report on plan for flood control and drainage development, Division of Waterways, Illinois Department of Public Works and Buildings.

2. Report on potential reservoir sites, Illinois Water Survey, Department of Registration and Education.

3. Report on recreational area potential, U. S. Department of Interior, Illinois Department of Conservation.

4. Report on fisheries resource, by counties, Division of Fisheries, Illinois Department of Conservation.

5. Report on game resource, by counties, Division of Game Management, Illinois Department of Conservation.

6. Report on pollution by mine and oil field waste, Illinois Department of Mines and Minerals.

7. Report on forest resource, Division of Forestry, Illinois Department of Conservation and U. S. Forest Service.

8. Mapping of area on 7½ minute quadrangle, Illinois Geological Survey, Department of Registration and Education.

In addition to these studies the Commission requested a report on stream pollution and the treatment of municipal and industrial waste. This report has been provided by the Illinois Department of Public Health. A report on the highways of the Basin was provided by the Division of Highways, Illinois Department of Public Works and Buildings.

The Commission desires to express its appreciation of the efforts of these agencies in cooperating and assisting with this analysis of

the resources of the Embarrass Basin. As the results of these investigations become available, it will be possible to recommend to the people of this region alternate programs for improving the efficiency with which the resources may be used. It is the responsibility of this Commission not only to recommend such proposals but to encourage implementation of programs which will enhance the economy of the region.

LAND CLASSIFICATION

Land as a spatial milieu is becoming more and more critical as the population of our nation grows and as the per capita demand for space increases. Changes in the requirements of land for residential sites, a corollary of the trend toward suburban living, have multiplied the area of land demanded by each family; the increased mobility of our population has caused the construction of multi-lane highways which occupy much wider rights of way; industrial growth and automation have caused great increases in the amount of land used for industrial sites; these and numerous other instances of changes in land use indicate that nonagricultural demands for land far exceed any anticipated expansion of the need for land for the production of food and fiber.

As competition for land intensifies, efforts should be made to utilize for nonagricultural purposes that land which is less well adapted for cultivation. The identification of land within a classification based upon factors associating the land with agricultural usage may then be considered desirable. In accord with this assumption the following categories were selected and the land within the Embarrass Basin classified; (1) land suited for intensive cultivation, (2) land

suited for limited cultivation, (3) land suited for cultivation with restrictive conservation practices; and, (4) nonagricultural land.

The Soil Conservation Service provided the Commission's staff with maps identifying "Problem Areas in Soil Conservation" in that portion of Illinois drained by the Wabash River and its tributaries. This map was used to delimit Soil Association areas within the Embarrass Basin. These area boundaries were then adjusted to coincide with topographic conditions as depicted on U. S. Geological Survey quadrangles. This provided a map of "problem areas" based upon land capability, slope conditions, soil characteristics and major use problems (erosion, drainage, etc.).

Problem areas were then identified with each of the classification categories; in this identification arbitrary decisions had to be made as to the feasibility of establishing farm practices which would permit adjustment of farming operations to the major hazards for this use of the land.

Land suited for intensive cultivation was considered to be that land having slopes of 0-3%, a dominant land use classification of I or II with no severe erosion or drainage problems (Figure 3).

Land suited for limited cultivation was identified as land having 1-7% slopes, dominant land use capability classification of II or III with drainage or erosion problems sufficiently severe to require the use of meadow and hay crops as an integral part of the crop rotation system or to require the use of mechanical conservation practices to maintain control of these problems.

Land suited for cultivation with restrictive conservation practices of 3-12%, dominant land capability classes III and IV with erosion

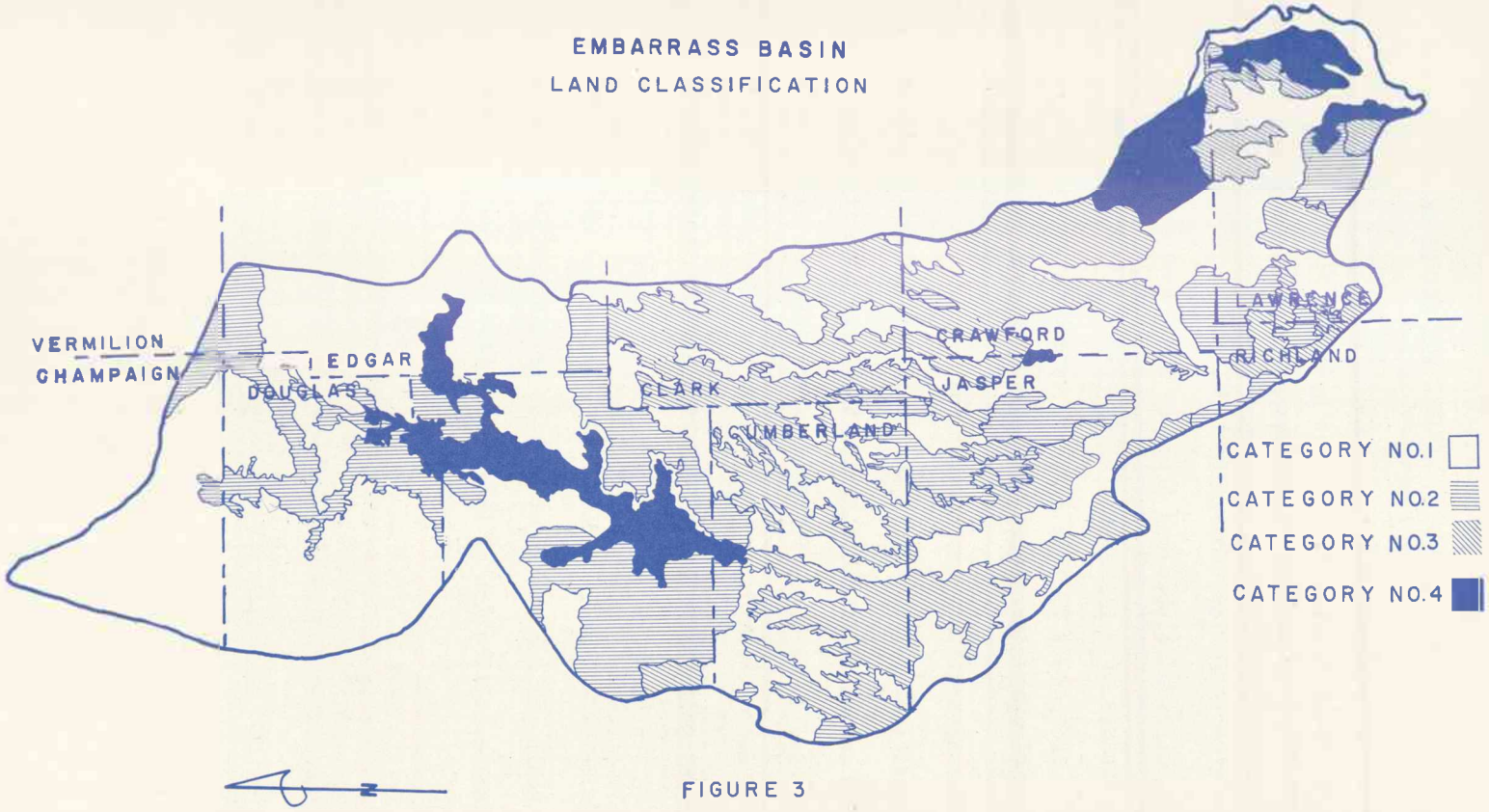

EMBARRASS BASIN
LAND CLASSIFICATION
VERMILION
CHAMPAIGN
EDGAR
DOUGLAS
CLARK
CUMBERLAND
CRAWFORD
JASPER
LAWRENCE
RICHLAND
CATEGORY NO.1
CATEGORY NO.2
CATEGORY NO.3
CATEGORY NO.4
N

FIGURE 3